

mass, the load being evenly distributed.

(c) *Test method.* All IBC design types must be raised and lowered twice by a lift truck with the forks centrally positioned and spaced at three quarters of the dimension of the side of entry (unless the points of entry are fixed). The forks must penetrate to three quarters of the direction of entry. The test must be repeated from each possible direction of entry.

(d) *Criteria for passing the test.* For all IBC design types designed to be lifted from the base, there may be no permanent deformation which renders the IBC unsafe for transportation and no loss of contents.

[Amdt. 178-103, 59 FR 38074, July 26, 1994, as amended at 66 FR 45386, Aug. 28, 2001]

#### § 178.812 Top lift test.

(a) *General.* The top lift test must be conducted for the qualification of all IBC design types designed to be lifted from the top or, for flexible IBCs, from the side.

(b) *Special preparation for the top lift test.* (1) Metal, rigid plastic, and composite IBC design types must be loaded to twice the maximum permissible gross mass with the load being evenly distributed.

(2) Flexible IBC design types must be filled to six times the maximum net mass, the load being evenly distributed.

(c) *Test method.* (1) A metal or flexible IBC must be lifted in the manner for which it is designed until clear of the floor and maintained in that position for a period of five minutes.

(2) Rigid plastic and composite IBC design types must be:

(i) Lifted by each pair of diagonally opposite lifting devices, so that the hoisting forces are applied vertically, for a period of five minutes; and

(ii) Lifted by each pair of diagonally opposite lifting devices, so that the hoisting forces are applied towards the center at 45° to the vertical, for a period of five minutes.

(3) If not tested as indicated in paragraph (c)(1) of this section, a flexible IBC design type must be tested as follows:

(i) Fill the flexible IBC to 95% full with a material representative of the product to be shipped.

(ii) Suspend the flexible IBC by its lifting devices.

(iii) Apply a constant downward force through a specially designed platen. The platen will be a minimum of 60% and a maximum of 80% of the cross sectional surface area of the flexible IBC.

(iv) The combination of the mass of the filled flexible IBC and the force applied through the platen must be a minimum of six times the maximum net mass of the flexible IBC. The test must be conducted for a period of five minutes.

(v) Other equally effective methods of top lift testing and preparation may be used with approval of the Associate Administrator.

(d) *Criteria for passing the test.* For all IBC design types designed to be lifted from the top, there may be no permanent deformation which renders the IBC, including the base pallets when applicable, unsafe for transportation, and no loss of contents.

[Amdt. 178-103, 59 FR 38074, July 26, 1994, as amended at 66 FR 33452, June 21, 2001; 66 FR 45386, Aug. 28, 2001; 68 FR 45042, July 31, 2003]

#### § 178.813 Leakproofness test.

(a) *General.* The leakproofness test must be conducted for the qualification of all IBC design types and on all production units intended to contain solids that are loaded or discharged under pressure or intended to contain liquids.

(b) *Special preparation for the leakproofness test.* Vented closures must either be replaced by similar non-vented closures or the vent must be sealed. For metal IBC design types, the initial test must be carried out before the fitting of any thermal insulation equipment. The inner receptacle of a composite IBC may be tested without the outer packaging provided the test results are not affected.

(c) *Test method and pressure applied.* The leakproofness test must be carried out for a suitable length of time using air at a gauge pressure of not less than 20 kPa (2.9 psig). Leakproofness of IBC design types must be determined by coating the seams and joints with a heavy oil, a soap solution and water, or other methods suitable for the purpose

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of detecting leaks. Other methods, if at least equally effective, may be used in accordance with appendix B of this part, or if approved by the Associate Administrator, as provided in § 178.801(i)).

(d) *Criterion for passing the test.* For all IBC design types intended to contain solids that are loaded or discharged under pressure or intended to contain liquids, there may be no leakage of air from the IBC.

[Amdt. 178–103, 59 FR 38074, July 26, 1994, as amended at 64 FR 10782, Mar. 5, 1999; 66 FR 45185, 45386, Aug. 28, 2001]

### § 178.814 Hydrostatic pressure test.

(a) *General.* The hydrostatic pressure test must be conducted for the qualification of all metal, rigid plastic, and composite IBC design types intended to contain solids that are loaded or discharged under pressure or intended to contain liquids.

(b) *Special preparation for the hydrostatic pressure test.* For metal IBCs, the test must be carried out before the fitting of any thermal insulation equipment. For all IBCs, pressure relief devices and vented closures must be removed and their apertures plugged or rendered inoperative.

(c) *Test method.* Hydrostatic gauge pressure must be measured at the top of the IBC. The test must be carried out for a period of at least 10 minutes applying a hydrostatic gauge pressure not less than that indicated in paragraph (d) of this section. The IBCs may not be mechanically restrained during the test.

(d) *Hydrostatic gauge pressure applied.*

(1) For metal IBC design types, 31A, 31B, 31N: 65 kPa gauge pressure (9.4 psig).

(2) For metal IBC design types 21A, 21B, 21N, 31A, 31B, 31N: 200 kPa (29 psig). For metal IBC design types 31A, 31B and 31N, the tests in paragraphs (d)(1) and (d)(2) of this section must be conducted consecutively.

(3) For metal IBCs design types 21A, 21B, and 21N, for Packing Group I solids: 250 kPa (36 psig) gauge pressure.

(4) For rigid plastic IBC design types 21H1 and 21H2 and composite IBC design types 21HZ1 and 21HZ2: 75 kPa (11 psig).

(5) For rigid plastic IBC design types 31H1 and 31H2 and composite IBC design types 31HZ1 and 31HZ2: whichever is the greater of:

(i) The pressure determined by any one of the following methods:

(A) The gauge pressure (pressure in the IBC above ambient atmospheric pressure) measured in the IBC at 55 °C (131 °F) multiplied by a safety factor of 1.5. This pressure must be determined on the basis of the IBC being filled and closed to no more than 98 percent capacity at 15 °C (60 °F);

(B) If absolute pressure (vapor pressure of the hazardous material plus atmospheric pressure) is used, 1.5 multiplied by the vapor pressure of the hazardous material at 55 °C (131 °F) minus 100 kPa (14.5 psi). If this method is chosen, the hydrostatic test pressure applied must be at least 100 kPa gauge pressure (14.5 psig); or

(C) If absolute pressure (vapor pressure of the hazardous material plus atmospheric pressure) is used, 1.75 multiplied by the vapor pressure of the hazardous material at 50 °C (122 °F) minus 100 kPa (14.5 psi). If this method is chosen, the hydrostatic test pressure applied must be at least 100 kPa gauge pressure (14.5 psig); or

(ii) Twice the greater of: (A) The static pressure of the hazardous material on the bottom of the IBC filled to 98 percent capacity; or

(B) The static pressure of water on the bottom of the IBC filled to 98 percent capacity.

(e) *Criteria for passing the test(s).* (1) For metal IBCs, subjected to the 65 kPa (9.4 psig) test pressure specified in paragraph (d)(1) of this section, there may be no leakage or permanent deformation that would make the IBC unsafe for transportation.

(2) For metal IBCs intended to contain liquids, when subjected to the 200 kPa (29 psig) and the 250 kPa (36 psig) test pressures specified in paragraphs (d)(2) and (d)(3) of this section, respectively, there may be no leakage.

(3) For rigid plastic IBC types 21H1, 21H2, 31H1, and 31H2, and composite IBC types 21HZ1, 21HZ2, 31HZ1, and 31HZ2, there may be no leakage and no